



Weed Flora in Transplanted Black Rice Fields of Village Khajuri in Bilaspur District of Chhattisgarh, India

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ABSTRACT

Introduction: There are many species of rice grown all over the world. One of the special species is black rice, which is also known as forbidden rice or purple rice, and it is mainly cultivated in Asia. The production of black rice is directly influenced by the infestation of weeds. Weeds are defined as unwanted plants or non-crop plants that are growing alongside crop plants in the same agricultural fields, which decreases crop yields and creates major problems for farmers.

Aim/Objectives: This study aimed to investigation, identification and documentation of the weed flora of black rice fields of village Khajuri in Bilaspur district of Chhattisgarh, India.

Materials and Methods: A field survey at regular intervals was conducted in the black rice fields of Khajuri village in Bilaspur district of Chhattisgarh from June to November 2023. The weeds were collected and identified with the help of authentic flora.

Results: Identification of weeds revealed 38 species belonging to 14 families, distributed by 11 dicot families with 21 genera and 22 species and 03 monocot families belonging to 11 genera and 16 species. The dicot and monocot ratio were observed as 11: 03. Thus, 79% weed species were found as dicots, and 21% were monocots. This clearly shows that the appearance of dicot species was greater than that of monocot species. *Echinochloa colona* (L.) Link, *Paspalum scrobiculatum* (L.), *Fimbristylis miliacea* (L.) Vahl, *Alternanthera sessilis* (L.) DC. *Eclipta prostrata* (L.), *Ammannia baccifera* L, *Ludwigia perennis* L., *Commelina benghalensis* L. were found as some major weeds in the study area.

Conclusion: It is concluded that the study of weed flora of black rice fields of study area gives us valuable information about weeds. This study may provide basic information for making better weed management strategies.

Key Words: Black rice, Bilaspur, *Cyperaceae*, Dicot, Khajuri, Weed flora

INTRODUCTION

Rice (*Oryza sativa* L.) is the staple food in India. There are many varieties of rice grown all over the world. One of the variety is black rice, also known as forbidden rice or purple rice, which was mainly cultivated in Asia. A 62 percent of the black rice in the world is produced by China, followed by Sri Lanka (8.6%), Indonesia (7.2%), India (5.1%), Bangladesh (4.1%), and a few in Malaysia.¹ In India, black rice is growing only in some parts, such as West Bengal, Jharkhand, and Odisha. Due to the presence of anthocyanin pigments, black rice gets a black-purple colour and has antioxidant and anticancer properties.² Black rice is rich in proteins, fibre, vitamin B and E, a good source of iron, and high in nutrients as compared to other rice varieties. Black rice is very useful for human health.³

The production of black rice is directly influenced by the infestation of weeds. Weeds are defined as unwanted plants or non-crop plants that are growing alongside crop plants in the same agricultural fields. Weeds are recognized as an important biotic constraint in crop production. They compete with crops for growth factors, viz., light, nutrients, soil moisture, space, etc., which result in yield losses and crop growth.⁴⁻⁸ Infestation of weeds creates major problems for farmers. Knowledge about the biology and ecology of weeds is very useful for effective weed management.⁹ Therefore, the main objective of the present study was the investigation, identification and documentation of the weeds in the black rice fields of village Khajuri in the Bilaspur district of Chhattisgarh. This study may provide basic information for making better weed management strategies.

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MATERIALS AND METHODS

Study area

A field survey was conducted in the black rice fields of Khajuri village in Bilaspur district of Chhattisgarh, India. The soil in this area is black and sandy. The study site is situated between 20° 2' north latitude and 81° 58' east longitude.

Data collection

Black rice has been sown for the first time in this study area. A field survey of the weed flora was conducted from June to November 2023 at regular intervals. All the weed species were collected, labelled, and pressed into a newspaper in the field during the flowering stage and identified with the available authentic flora and e-resources. When the weed species or voucher specimens were completely dry, herbarium specimens were prepared.

RESULTS

Black rice fields were infested with 38 weed species belonging to 14 families, distributed by 11 dicot families with 21 genera and 22 species and 03 monocot families belonging to 11 genera and 16 species. Most of the weeds belonged to the *Poaceae* family (8 weed species) and *Cyperaceae* (6 weed species), as shown in Table 1 and Figure 1. The result revealed that the *Poaceae* and *Cyperaceae* were the most dominant families in the black rice fields. *Echinochloa colona* (L.) Link, *Paspalum scrobiculatum* L., *Fimbristylis miliacea* (L.) Vahl, *Alternanthera sessilis* (L.) DC., *Eclipta prostrata* (L.) L., *Ammannia baccifera* L., *Ludwigia perennis* Burm. f., and *Commelina benghalensis* L. were found as some major weeds in the study area. Figure 3 showed some major weeds of black rice fields in the study sites and these weeds are more competitive and aggressive for black rice.

The total weeds computed in the black rice fields were 38 species. Out of which, 79% were found as dicots and 21% were monocots. The dicot-to-monocot ratio was 11:03, which clearly indicates that the appearance of dicot species was greater than that of monocot species (Figure 2).

DISCUSSION

Total 38 weed species were found in the black rice fields of Khajuri village in Bilaspur district of Chhattisgarh, India. Similar work has been done by many researchers; the weed flora of the paddy crop in Bilaspur district, Chhattisgarh, it was recorded by Dubey.¹⁰ Pragada and Mulliboyana¹¹ worked on the weeds of rice fields in the North Coastal of Andhra Pradesh and observed a total of 65 weed species. Duary et al.¹² reported a total of 35 weeds from major crops in the red

and lateritic belt of West Bengal, Purulia district. Punia et al.¹³ reported that 28 weed species infested transplanted rice in Haryana. Moghe¹⁴ studied the weed flora of rice crops in Sakri, Domuhani, and Birkona villages of Bilaspur district (C.G.) and recorded 50 weed species belonging to 16 families. Soni and Sharma¹⁵ worked on weed flora in rice fields in Bilaspur district (C.G.) and obtained 41 weeds belonging to 10 families. The works of all these discussed about weed problem and their management strategies. Weeds create major problems in production of rice and causes economic loss.

CONCLUSION

From the present study, it has been concluded that black rice fields are very much infested by different weed species in Khajuri village of Bilaspur district in Chhattisgarh, India. *Echinochloa colona* (L.) Link, *Paspalum scrobiculatum* L., *Fimbristylis miliacea* (L.) Vahl, *Alternanthera sessilis* (L.) DC., *Eclipta prostrata* L., *Ammannia baccifera* L., *Ludwigia perennis* L., and *Commelina benghalensis* L. were found as major weeds at the study area. This study may provide basic information for making better weed management strategies.

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Authors' Contribution:

All authors contributed equally to the research. [Author A] conceptualized and designed the study. [Author B] collected and analyzed the data. [Author C] drafted the manuscript. All authors reviewed, edited, and approved the final version of the paper and are accountable for its content.

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Table 1: Weed flora present in black rice fields of study area.

S.N.	Scientific name of plants	Family	Group	Genus	Species
	<i>Asteracantha longifolia</i> L.	<i>Acanthaceae</i>	Dicot	01	01
	<i>Achyranthes aspera</i> L.	<i>Amranthaceae</i>	Dicot	02	02
	<i>Alternanthera sessilis</i> (L.) DC.				
	<i>Acmella uliginosa</i> (Sw.) Cass.	<i>Asteraceae</i>	Dicot	03	03
	<i>Ageratum conyzoides</i> L.				
	<i>Eclipta prostrata</i> (L.) L.				
	<i>Evolvulus nummularius</i> (L.)L.	<i>Convolvulaceae</i>	Dicot	02	02
	<i>Merremia emarginata</i> (Burm.f.) Hallier f.				
	<i>Euphorbia hirta</i> L.	<i>Euphorbiaceae</i>	Dicot	01	01
	<i>Aeschynomene indica</i> L.	<i>Fabaceae</i>	Dicot	04	04
	<i>Desmodium triflorum</i> (L.) DC.				
	<i>Rhynchosia minima</i> (L.)DC.				
	<i>Vigna trilobata</i> (L.) Verdc.				
	<i>Ammannia auriculata</i> Willd.	<i>Lytheraceae</i>	Dicot	01	02
	<i>Ammannia baccifera</i> L.				
	<i>Abutilon indicum</i> (L.) Sweet	<i>Malvaceae</i>	Dicot	03	03
	<i>Malachra capitata</i> (L.)L.				
	<i>Sida cordata</i> (Burm.f.) Borss.Waalk.				
	<i>Ludwigia perennis</i> L.	<i>Onagraceae</i>	Dicot	01	01
	<i>Mecardonia procumbens</i> (Mill.) Small	<i>Plantaginaceae</i>	Dicot	01	01
	<i>Corchorus aestuans</i> L.	<i>Tiliaceae</i>	Dicot	01	01
	<i>Commelina benghalensis</i> L.	<i>Commelinaceae</i>	Monocot	02	02
	<i>Murdannia nudiflora</i> (L.) Brenan				
	<i>Cyperus difformis</i> L.	<i>Cyperaceae</i>	Monocot	02	06
	<i>Cyperus esculentus</i> L.				
	<i>Cyperus haspan</i> L.				
	<i>Cyperus iria</i> L.				
	<i>Cyperus rotundus</i> L.				
	<i>Fimbristylis miliacea</i> (L.) Vahl				
	<i>Cynodon dactylon</i> (L.) Pers.				
	<i>Dactyloctenium aegyptium</i> (L.) Willd.				
	<i>Digitaria sanguinalis</i> (L.) Scop.	<i>Poaceae</i>			
	<i>Echinochloa glabrescens</i> Kossenko				
	<i>Echinochloa colona</i> (L.) Link			08	09
	<i>Eleusine indica</i> (L.) Gaertn.				
	<i>Ischaemum rugosum</i> Salisb				
	<i>Oplismenus burmanni</i> (Retz.) P. Beauv.		Monocot		
	<i>Paspalum scrobiculatum</i> L.				
	Total	14		32	38

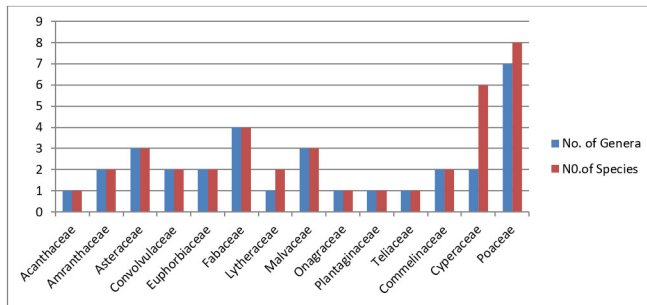


Figure 1: Number of species and genera in each family

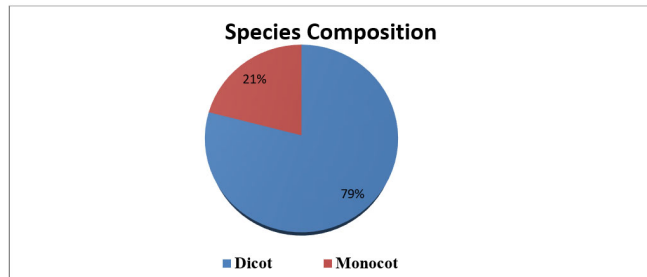


Figure 2: Species composition of dicot and monocot species

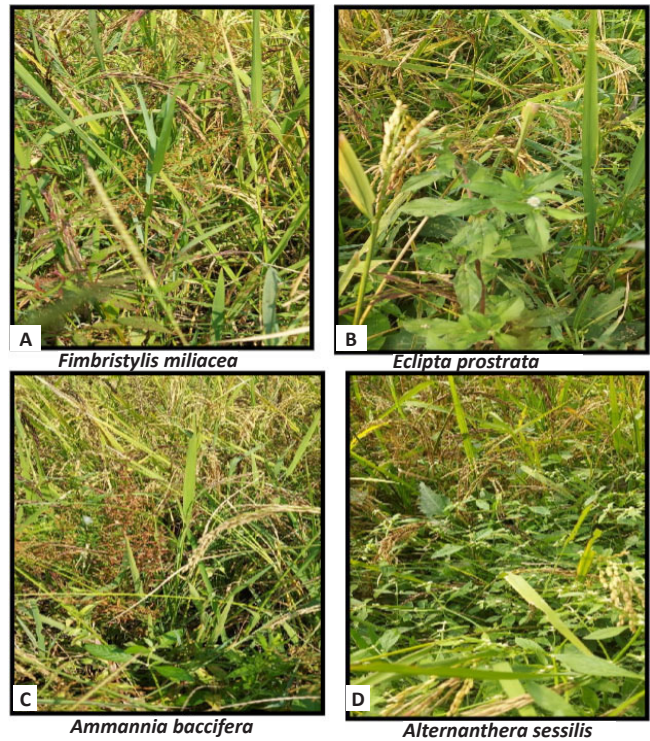


Figure 3: Some major weeds of black rice fields at the study site-(A) *Fimbristylis miliacea* (L.) Vahl, (B) *Eclipta prostrata* (L.) L., (C) *Ammannia baccifera* L. and (D) *Alternanthera sessilis* (L.) DC.